1. A dual-mode UWB and WLAN transceiver comprising:

a digital lowpass-shaping filter system coupled to a UWB multichannel PN sequence mapping or a WLAN IFFT and I/Q modulation;

a dual-mode sampling frequency rate coupled to a digital-to-analog converter; and

a switch to connect from the UWB multichannel PN sequence mapping or the WLAN IFFT and I/Q modulation to the digital lowpass-shaping filter system.

2. The dual-mode UWB and WLAN transceiver of claim 1 wherein said digital lowpass-shaping filter system can be controlled by using said switch to connect said UWB multichannel PN sequence mapping or said WLAN IFFT and I/Q modulation.

3. The dual-mode UWB and WLAN transceiver of claim 1 wherein said digital lowpass-shaping FIR filter system includes:

an indoor UWB digital FIR lowpass shaping filter;

an outdoor UWB digital FIR lowpass shaping filter;

an WLAN digital multistage FIR lowpass shaping filter;

and two controllable switches.

4. The dual-mode UWB and WLAN transceiver of claim 3 wherein said digital lowpass-shaping FIR filter system can

select to use said indoor UWB digital FIR lowpass shaping filter or said outdoor UWB FIR lowpass shaping filter or said WLAN digital multistage FIR lowpass shaping filter by using said two controllable switches.

5. The dual-mode UWB and WLAN transceiver of claim 3 wherein said WLAN digital multistage FIR lowpass shaping filter comprises:

a first stage of upsampling by 2 and a WLAN digital 12^{th} enlarged band lowpass shaping FIR filter; and a second stage of upsampling by 12 and a WLAN digital rejected lowpass FIR filter.

6. The dual-mode UWB and WLAN transceiver of claim 5 wherein said WLAN digital multistage FIR lowpass shaping filter is a two stage interpolation lowpass shaping FIR filter with upsampling of 24.

7. The dual-mode UWB and WLAN transceiver of claim 1 wherein dual-mode sampling frequency rate includes:

a UWB sampling frequency unit;

a WLAN sampling frequency unit;

a MUX unit; and

a selectable unit.

8. The dual-mode UWB and WLAN transceiver of claim 7 wherein said dual-mode sampling frequency rate can be controlled to select either one sampling rate for the UWB mode or other sampling rate for the WLAN mode by using said MUX unit with said selectable unit.

9. The dual-mode UWB and WLAN transceiver of claim 1 wherein said only one digital-to-analog converter is needed for the dual-mode UWB and WLAN transmitter.

10. A dual-mode UWB and WLAN multichannel-based multi-carrier comprising:

an analog lowpass filter;

a multiplier;

two MUX units;

three commuter units;

three selectable mutlcarrier frequencies; and

three switches.

11. The dual-mode UWB and WLAN multichannel-based multi-carrier of claim 10 wherein said multichannel-based multicarrier can select a carrier frequency from either in UWB mode or in WLAN mode by controlling said MUX unit and said switches.

12. The dual-mode UWB and WLAN multichannel-based multi-carrier of claim 10 wherein said only one analog lowpass filter is needed for either UWB transmitter mode or WLAN 802.11a transmitter mode.

13. The dual-mode UWB and WLAN multichannel-based multi-carrier of claim 10 wherein said MUX units and said switch units are programmable controllable.

14. A dual-mode UWB and WLAN communication receiver comprising:

an analog-to-digital converter with same sampling frequency rate and same resolution bit;

a pre-switch to provide information to a rake receiver or to an I/Q demodulation;

a digital receiver filter system to provide information to the pre-switch;

a post-switch to provide information to a block de-interleaver; and

a de-spreading of PN sequence and de-mapping or a FFT mapping unit to provide information to the post-switch.

15. The dual-mode UWB and WLAN communication receiver of claim 14 wherein said analog-to-digital converter has the same sampling frequency rate and the same resolution bit for both UWB and WLAN receiver.

16. The dual-mode UWB and WLAN communication receiver of claim 14 wherein said pre-switch may be programmable to connect a position with said rake receiver during the UWB mode or to connect a position with said I/Q demodulation during the WLAN mode.

17. The dual-mode UWB and WLAN communication receiver of claim 14 wherein said post-switch may be programmable to connect a position with said de-spreading of PN sequence and de-mapping during the UWB receiver mode or to connect a position with said FFT mapping during the WLAN receiver mode.

18. An article comprising a medium for storing instructions that cause a digital signal processor-based dual-mode UWB and WLAN transceiver system to:

Selectively set the sampling frequency rate for the digital-to-analog converter during the UWB or WLAN transmitter mode;

Selectively set the connection with UWB multichannel PN sequence mapping or the connection with WLAN I/Q modulation and IFFT during the transmitter;

Selectively set the digital lowpass-shaping transmitter filter for the indoor UWB, outdoor UWB or WLAN during the transmitter;

Selectively set the use of the multicarrier of the UWB or WLAN lower and upper multicarrier during the transmitter;

Selectively set the connection with UWB rake receiver or WLAN I/Q demodulation and FFT.

Selectively set the no multicarrier for the indoor or outdoor UWB for certain channels.

19. The article of claim 18 further storing instructions that cause a digital signal processor-based dual-mode UWB and WLAN transmitter system to control the selectable MUX unit to select either the UWB sampling frequency rate for UWB mode or the WLAN sampling frequency rate for WLAN mode to support the digital-to-analog converter.

20. The article of claim 18 further storing instructions that cause digital signal processor-based dual-mode UWB and WLAN transmitter system to control the two switches to connect with UWB baseband functions of the multichannel PN sequence mapping during the UWB mode or to connect with WLAN based functions of the WLAN IFFT and I/Q modulation during the WLAN mode.

21. The article of claim 18 further storing instructions that cause digital signal processor-based

dual-mode UWB and WLAN transmitter system to control the two switches to connect with indoor UWB transmitter filter or outdoor UWB transmitter filter or to connect with WLAN multistage transmitter filter.

22. The article of claim 18 further storing instructions that cause digital signal processor-based dual-mode UWB and WLAN transmitter system to control the MUX unit to select the multicarrier frequencies from the UWB mode or from the WLAN mode.

23. The article of claim 18 further storing instructions that cause digital signal processor-based dual-mode UWB and WLAN receiver system to control two switches to connect with UWB baseband functions of the rake receiver and de-spread of PN sequence and de-mapping during the UWB mode or to connect with WLAN based functions of the I/Q demodulation and mapping during the WLAN mode.